1: Virology 1999 May 10;257(2):352-62

Protection of chickens against very virulent infectious bursal disease virus (IBDV) and Marek's disease virus (MDV) with a recombinant MDV expressing IBDV VP2.

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To develop a herpes virus vaccine that can induce immunity for an extended period, a recombinant Marek's disease (MD) virus (MDV) CVI-988 strain expressing infectious bursal disease virus (IBDV) host-protective antigen VP2 at the US2 site (rMDV) was developed under the control of an SV40 early promoter. Chickens vaccinated with the rMDV showed no clinical signs and no mortality and 55% of the chickens were considered protected histopathologically after challenge with very virulent IBDV (vvIBDV), whereas all of the chickens vaccinated with the conventional IBDV vaccine showed no clinical signs and were protected. Chickens vaccinated with the CVI-988 or chickens in the challenge control showed severe clinical signs and high mortality (70-75%) and none of them were protected. Also, the rMDV conferred full protection to chickens against vvMDV just as the CVI-988 strain did, whereas 90% of the challenge control chickens died of MD. Antibody levels against IBDV and MDV following the vaccination increased continuously for at least 10 weeks. No histopathological lesions in the rMDV-vaccinated chickens and no contact transmission of the rMDV to their penmates were confirmed. These results demonstrate that an effective and safe recombinant herpesvirus-based IBD vaccine could be constructed by expressing the VP2 antigen at the US2 site of the CVI-988 vaccine strain.

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ELSEVIER SCIENCE FULL-TEXT ARTICLE

Dual-viral vector approach induced strong and long-lasting protective immunity against very virulent infectious bursal disease virus.

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To induce strong protective immunity against very virulent infectious bursal disease virus (vvIBDV) in chickens, two viral vector systems, Marek's disease and Fowlpox viruses expressing the vvIBDV host-protective antigen VP2 (rMDV, rFPV), were used. Most of chickens vaccinated with the rFPV or rMDV alone, or vaccinated simultaneously with both at their hatch (rMDV-rFPV(1d)), were protected against developing clinical signs and mortality; however, only zero to 14% of the chickens were protected against gross lesions. In contrast, gross lesions were protected in 67% of chickens vaccinated primarily with the rMDV followed by boosting with the rFPV 2 weeks later (rMDV-rFPV(14d)). Protection against the severe histopathological lesions of rFPV, rMDV, rMDV-rFPV(1d), and rMDV-rFPV(14d) vaccine groups were 33, 42, 53, and 73%, respectively. Geometric mean antibody titers to VP2 of chickens vaccinated with the rFPV, rMDV, rMDV-rFPV(1d), and rMDV-rFPV(14d) before the challenge were 110, 202, 254, and 611, respectively. Persistent infection of the rMDV in chickens after the booster vaccination with rFPV was suggested by detection of the rMDV genes from peripheral blood lymphocyte DNA at 28 weeks of age. These results indicate that the dual-viral vector approach is useful for quickly and safely inducing strong and long-lasting protective immunity against vvIBDV in chickens.

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